DELAWARE CENTER FOR THE INLAND BAYS

Inland Bays Journal

SPRING | SUMMER 2016

Bats Around the Bays

By Andrew McGowan,
Environmental Scientist, CIB

If ever there was an animal that needed a public relations manager, it's a bat.

Portrayed as minions of evil villains, friends of vampires, and creepy crawly rabies vectors, bats have suffered from serious negative publicity. And while bats can transmit rabies, the Center for Disease Control and Prevention estimates that only about 6% of bats actually have rabies.

Unfortunately, all the bad press has overshadowed just how important bats are to us.

The Delmarva Peninsula is home to at least nine species of bats (Eastern red, Big brown, Silver-haired, Hoary, Tri-colored, Evening, Little brown, Eastern small-footed, and Northern long-eared). All feed exclusively on insects, including mosquitoes, beetles, and moths. Because they are voracious eaters, bats help control insect populations that could otherwise seriously impact both agriculture, and human health (and enjoyment of the outdoors). *(continued on page 6)*

Big brown bat pup.

What's Inside

Letter from the Director, see page 2.

It's Not Just Dirt, see page 3.

What's in the Water, see page 4.

The Inland Bays Journal is a publication of the Delaware Center for the Inland Bays. The CIB is a nonprofit organization and a National Estuary Program. The purpose of the Inland Bays Journal is to educate and inform citizens and visitors to the Inland Bays watershed about this "estuary of national significance."

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Cover photo credit: Holly Niederriter, DNREC Fish & Wildlife

Dear Friends of the Bays,

Of all the sources of pollution, 'point sources' are supposed to be the easiest to find and remove because, well, you can point to them—like a pipe from a wastewater treatment plant. You know right where the pollution is coming from and you can measure how much is going into your water.

In 1998, the State of Delaware required the removal of all point sources to the Inland Bays.

Almost twenty years and twelve capped pipes later, there effectively remained one point source of pollution entering the Bays—the City of Rehoboth wastewater treatment plant—and last year, Rehoboth recommitted to removing their pipe by the year 2018.

I envisioned this to be the end of a long process to address what was thought to be the 'low hanging fruit' of pollution sources.

But, in the category of 'not so fast,' another potential point source of pollution has re-emerged—the former Pinnacle Foods in Millsboro.

In 2014 the poultry company Allen Harim bought the former pickling plant from Pinnacle. The new owner originally proposed to convert the facility to poultry processing. They planned to remove their existing pipe from the wastewater treatment plant that discharged into Wharton's Branch, in favor of applying wastewater to croplands. They presented their plan at a meeting of the CIB Board of Directors that year.

But Allen Harim later applied to renew the plant's expired wastewater discharge permit (which was for pickling brine), and discharge their wastewater directly to Wharton's Creek which flows into Indian River. The accompanying application for the permit was unclear in describing a plan to mitigate the pollution that would enter the creek.

Last fall, Allen Harim changed its plan to convert the plant for poultry operations and instead expand their existing poultry processing plant in Harbeson. Unresolved in that decision is the future of the empty facility in Millsboro and its wastewater pipe in Wharton's Branch. The Department of Natural Resources and Environmental Control is in discussion with Allen Harim about its intentions for the facility and the resolution of the expired permit for its wastewater pipe.

Everyone hopes for a productive use of the Millsboro plant that is compatible with the local community and protective of the Inland Bays. However, it must be made clear to the existing owner or a new buyer, that any use of the facility must abide by Delaware state regulations by eliminating the point source of pollution into Wharton's Creek.

The health of Wharton's Branch, Indian River, and all that live in and around our Inland Bays depend upon it.

Chris Bason, Executive Director

Heading up Indian River

By Dr. Emily Seldomridge, Watershed Coordinator, CIB

At first glance, soil may appear devoid of life, but in fact, healthy soils teem with billions of bacteria, fungi, and other microbes that are critical to soil health.

Viewing the soil as a living ecosystem reflects a fundamental shift in the way we care for our soils. Soil isn't an inert growing medium, but a living system that sustains plants, animals, and humans.

Because agriculture is the largest use of land in the Inland Bays watershed—nearly 100 of the 292 square mile watershed—promoting healthy farm soils is key to improving water quality in our creeks and bays.

Since soil type and structure are highly variable in different locations, there is no one size fits all for achieving and maintaining soil health. Some traditional methods include 'no-till' farming to protect soil from erosion, rotating crops, and planting cover crops.

The Sussex Conservation District (SCD) provides technical guidance and financial assistance to enhance, maintain, protect and improve land and water resources. David Baird, Director of the Sussex Conservation District said, "After attending the 2014 Cover Crop and Soil Health Forum, it became clear that there was a need to bring soil health information to our farmers here in Sussex County." So, in 2015, SCD launched the Delaware Soil Health Partnership with the Delaware Department of Natural Resources and Environmental Control and the University of Delaware.

"Since SCD was founded in 1944, we have worked with farmers to promote voluntary implementation of agricultural best management practices (BMPs) to preserve and protect our productive soils. Incentive programs for planting cover crops have been at the center of that effort. Through this new partnership, we're working to shift the focus to managing for soil health," said Baird.

The success of the partnership hinges on farmer participation, so SCD met with several progressive, 'early adopters,' and held soil health workshops to identify gaps in information and the best way to share materials.

"The Sussex Conservation District is always looking for innovative ideas to improve soil health," said Baird, so one of the first initiatives of the Partnership was the acquisition of an 'air seeder.' The air seeder is a machine that allows a winter cover crop to be planted while a summer crop, such as corn, is still standing in the field. The equipment has a 90-foot boom that drops seed below the canopy of the summer crop with minimal damage to it. Early planting gives the cover crop a head start during the summer growing season and allows the cover crop to be established before the summer crop is harvested.

The early planting of the cover crop improves soil health by increasing nutrient uptake to the plants. Efficient use of the nutrients by the plants reduces the amount of nutrients that can make their way into our bays where they cause algae blooms. A win-win for farmers and the Bays.

(continued on page 7)

THE POWER OF HEALTHY SOIL

Healthy soil supports clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes.

- **Regulates water—Soil helps control the movement of rain, snowmelt, and irrigation water.**
- **Filters and buffers potential pollutants—The minerals and microbes in soil filter, buffer, and detoxify organic and inorganic materials.**
- **Cycles nutrients—Carbon, nitrogen, phosphorus, and many other nutrients are stored, transformed, and cycled in the soil.**

What's in the WATER?

Harmful Bacteria in the Inland Bays

Photo by Dennis Bartow

By Dr. Marianne Walch
CIB Science and Restoration Coordinator

Swimming, boating, clamming and fishing are among the great joys of living and vacationing on Delaware's Inland Bays. However, as signs posted around the Inland Bays caution, 'The waters of the Inland Bays may contain organisms that could be harmful to your health.'

Inland Bay waters are home to a wide range of bacteria that are most prevalent in the summer months. Most are normally harmless to humans, but a small portion of bacteria found in our bays are pathogens—that is, they have the potential to cause disease.

Bacteria in our Bays…the good and the bad

Bacteria are essential components of all ecosystems, including estuaries such as the Inland Bays. The overwhelming majority of microorganisms in the bays are naturally occurring and beneficial; they fill important roles such as decomposing wastes, transforming chemicals, and carrying out functions necessary to sustain the food chain.

Dr. Marianne Walch

But harmful bacteria, viruses, and parasites may be introduced by pollution, especially from human or animal feces.

Bacteria levels are affected by water temperature and salinity. They thrive in warmer waters and are most common in the summer and early fall. Recent research has shown that populations of potentially pathogenic *Vibrio* bacteria increase significantly when algae blooms form, fed by excess nutrients in the water. As climate change increases the temperature of the Bays, both algal blooms and *Vibrio* could persist later in the season.

What illnesses and infections can be caused by pathogens?

Illnesses associated with bacterial pollution include ear infections, skin rashes and gastrointestinal diseases such as dysentery, shigellosis, and typhoid fever. Viruses of concern that are transported in fecal-contaminated water include hepatitis A, Norwalk-type virus, and rotavirus. Shellfish such as oysters, mussels, and clams can concentrate the pathogens in their tissues, making them dangerous for humans to eat.

YOU CAN HELP

- **Hook up to public sewer when it comes to your community.**
- **If you have a septic system; have it inspected and maintained regularly.**
- **Clean up after your pets; Just one ounce of dog feces contains 23 million fecal coliform bacteria (nearly twice that of human waste), which are known to cause cramps, diarrhea, intestinal illness, and serious kidney disorders in humans.**
- **Capture the stormwater runoff from your roof and paved surfaces with swales or raingardens; keep it out of the street and storm drains.**
- **If you live on the water, plant a buffer of shrubs and grasses between your lawn and the water to capture and filter stormwater before it enters the bay, creek or canal.**
- **If you are a boater, properly dispose of boat toilet waste.**
- **Don't feed the wildfowl; let waterbirds find their own food.**
- **Support legislation that promotes cleanup of water pollution sources and limits impervious surface.**

TAKE PRECAUTIONS TO STAY SAFE

- **Avoid water contact if you have open skin wounds.**
- **Wear shoes and gloves when working on your boat, handling crab pots or other equipment.**
- **If you get a cut or scrape, clean it immediately with soap and clean water. If a wound becomes infected get medical attention.**
- **Carry hand sanitizer and a first aid kit on your boat, or when you're working around the water.**
- **Always shower after contact with bay, creek or canal waters and wash hands before handling or eating food.**

People with open wounds, liver disease, or compromised immune systems should take extra care. While infections are rare, normally harmless aquatic bacteria can cause infections in these cases. A variety of natural estuarine bacteria have been associated with wound infections, including species of the genera *Vibrio*, *Aeromonas*, and *Mycobacterium*. The Centers for Disease Control and Prevention reports that such infections have increased over the past couple of decades, particularly in warmer southern coastal states.

How do harmful bacteria get in the Bays?

Potentially harmful fecal bacteria and viruses can enter our water from a variety of sources:

- Wastes from pets and wildlife
- Stormwater runoff from yards and paved surfaces
- Malfunctioning septic systems
- Wastewater treatment facilities
- Discharge from marine toilets
- Agricultural manure

Bacteria levels in many areas are higher immediately after it rains due to stormwater runoff from impervious surfaces such as roads and parking lots that can carry bacteria.

Monitoring bacteria in the Inland Bays

During the summer months, the University of Delaware Citizen Monitoring Program and the Delaware Department of Natural Resources and Environmental Control (DNREC) test waters at over two dozen sites throughout the Bays. They monitor levels of *Enterococcus*, a type of bacteria that can indicate the presence of other harmful fecal bacteria and pathogens.

In salty waters like our bays, *Enterococcus* levels are assessed using both a single-sample safe swimming standard of 104 *Enterococcus* colonies/100 milliliters and a long-term mean standard of 35 colonies/100 milliliters. Approval of waters for shellfishing is based on measured levels of indicator bacteria, and proximity to a potential pollution sources, such as a marina.

Our waters often fail to meet safe swimming standards, particularly in some tributaries and poorly flushed canals. Tributaries and canals tend to have higher bacteria levels because pollution from the land is more concentrated and the water is less salty, making it more hospitable to the survival of pathogens. Bacteria levels can vary by location within a tributary, typically increasing upstream. Well-flushed areas in the open bays generally measure within the safe swimming standard.

(Bats cont. from page 1)

A single colony of 150 Big brown bats can consume 1.3 million agricultural pest insects per year. All told, bats save the U.S. agricultural industry an estimated 22.9 billion dollars per year. This incredible savings is passed on to farmers who in turn pass it on to consumers. So next time you're buying ten ears of corn for $2, you can thank the farmers as well as your local bat population.

A single colony of 150 Big brown bats can consume 1.3 million agricultural pest insects per year.

Local bats are in danger.

White-Nose-Syndrome, a fungal disease, has decimated the populations of cave-dwelling bats. First detected in Albany, New York in 2006, the disease which grows along the wings, tail, throat, and nose, has killed an estimated 5.5 million bats. White-Nose-Syndrome has been detected on the Delmarva Peninsula, and the spread of this disease is being monitored.

YOU CAN HELP

- Local Bats use forest edges more than any other habitat. The preservation of these edges, or even the preservation of a row of trees between two fields can provide bats with valuable foraging habitat.
- The preservation of forests is critical for these creatures. Bats use snags (dead trees) with loose bark for roosting and many serve as nurseries for young bats.
- Access to clean drinking water is also necessary to ensure healthy bat populations.
- Bat boxes can be installed to encourage bats to forage and roost in your area. These boxes can be built or purchased. They should be mounted facing south (getting at least 5 hours of sunlight a day) and be at least 12 feet off the ground. Boxes should be installed in the open, not on trees. Bats are very particular about their maternity roost sites, and it can take years for a bat box to be used, even when the dimensions are just right.

Wind turbines, while crucial to the switch from fossil fuels to green energy, can in some cases pose a serious threat to bats, but large facilities in places such as Oregon and Oklahoma kill relatively few bats, for reasons not yet fully understood. Contrast this with turbines in the Appalachians, which are estimated to kill tens of thousands of bats annually. Because species such as the Hoary bat and Silver-haired bat are particularly vulnerable at these sites, there is concern that our local population of these species may suffer a similar fate. Further research is needed to protect these valuable animals.

To learn more or to volunteer with the Delaware Bat Program go to dnrec.delaware.gov/fw/bats.

To learn more about bat conservation check out batcon.org.

INTERESTING BAT FACTS

- Bats are the only mammals that fly and represent 20% of the classified mammals on earth.
- Most bats within our watershed are tree bats, which are primarily solitary, and use trees as opposed to caves for roosting.
- Many of our local species migrate in the fall and spring, although the exact location and migratory routes are still largely a mystery.
- Our local species have lifespans exceeding twenty years in some cases.
- Most local bats produce only a single pup per year.
- With long lifespans, and low reproductive rates, bat populations are slow to recover after a mass mortality event such as white-nose-syndrome.
- Local bats may return to the same patch of woods year after year.

Big brown bat
Photo credit: Holly Niederriter, DNREC Fish & Wildlife

(Soil cont. from page 3)

The air seeder, which allows a cover crop to be planted before the summer crop is harvested, has been used in the Midwest, but never before in Delaware. Photo by the Sussex Conservation District

Baird credits the use of the air seeder, and the farmers' desire to be good stewards of the land, for the overall increase in acreage of cover crops planted; from 32,436 in 2014 to 39,374 acres in 2015. In 2015, year one of the program, 4,017 acres were planted with the air seeder. Our goal is to double that to 8,000 acres in 2016," said Baird.

"Although a multi-faceted approach is needed to clean up the Inland Bays," Baird says, "Cover crops are an invaluable tool in the toolbox."

Director of the Sussex Conservation District, David Baird, serves on the CIB Board of Directors. For more information about the SCD visit sussexconservation.org.

How the Sussex Conservation District works for communities and the Bays…

The SCD responds to citizen concerns about runoff from construction sites into local waterways.

In this case, on Dirickson Creek, the SCD sent out an inspector as soon as they were alerted to the problem by a citizen. The discharge into the Creek was dammed and the builder will manage their runoff onsite. These actions aim to eliminate future discharges into the Creek at this site. The resident was thanked by the SCD for bringing the problem to their attention.

Since 1991, the Sussex Conservation District has administered Delaware's Sediment and Stormwater Regulations in Sussex County. The SCD reviews, inspects, and performs maintenance inspections of construction projects which disturb more than 5,000 square feet. These projects vary from construction of small commercial sites to large golf course communities. The purpose of the stormwater program is to ensure that the property's stormwater is maintained on site.

The SCD in coordination with DNREC also provides technical assistance to property owners with drainage and flooding concerns. For more information on the services of the SCD go to their website at sussexconservation.org.

The Sussex Conservation District is one of the DE Center for the Inland Bays' critical partners in protecting and restoring the waters of the Inland Bays.

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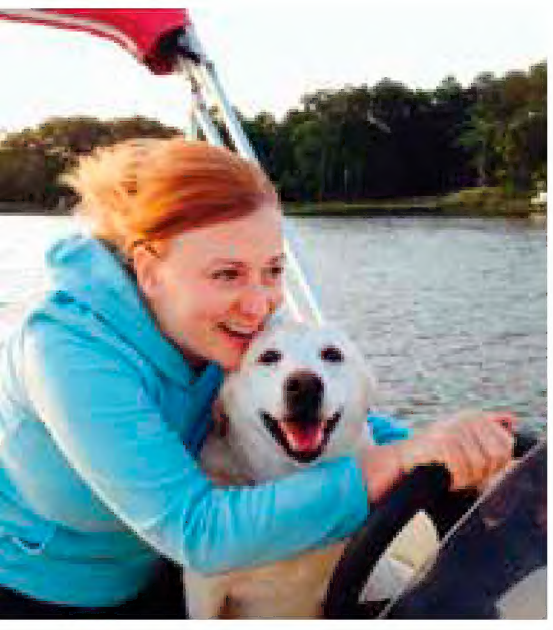
Welcome Heidi Gilmore!

Gilmore fills first new seat on the CIB Board of Directors



The Delaware Center for the Inland Bays is pleased to announce the election of Heidi Gilmore to the first Board-elected seat on the Board of Directors. An attorney and partner with the law firm Baird, Mandalas, Brockstedt (BMB), Heidi has been an avid supporter of the CIB since 2008 and, with her husband Kevin, has been a Patron of the Bays since 2015.

As a real estate attorney, Heidi uses her many connections in the community to share her passion for protecting and preserving the Inland Bays. From her home on Herring Creek where she lives with her husband and two dogs, Heidi has a unique front seat view to the challenges that are affecting the Bays. She wants to play an active role in restoring the Bays so people can continue to enjoy all that they offer for generations to come.

"I am honored to serve on the Board and expand my personal interest in the improvement of the beautiful inland waterways that so many in Sussex County use and enjoy. I hope my involvement with the CIB will increase my knowledge, awareness and respect for the Inland Bays so I can share my love for them with many more people that use them."

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